

Module 4 Abstract: Principles of Drug Metabolism and Toxicokinetics and Applications to Pharmaceutical Toxicology

Basic Topics in Toxicology eLearning Seminar

This lecture explains the basic concepts of absorption, distribution, metabolism, and excretion (ADME) of both small and large molecules. It focuses on toxicokinetic parameters such as T_{max} , C_{max} , and area under the curve (AUC), bioavailability, and volume of distribution. Various factors that affect ADME parameters such as physicochemical properties of chemicals, storage depots, drug metabolizing enzymes, metabolism by intestinal microflora, and elimination kinetics are discussed. Additionally, monoclonal antibody disposition, distribution, and clearance are also discussed. The application of toxicokinetics in interpretation of toxicological findings, scaling in dose response extrapolation, determining the margin of safety (MOS) is explained using specific examples. Further, characterization of disproportionate metabolites and their safety assessment is discussed. Finally, the physiologically based pharmacokinetic modeling capable of accommodating more complex dosing regimens is addressed.